

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of

Inquiry Concerning the Deployment of Advanced
Telecommunications Capability to All Americans
in a Reasonable and Timely Fashion, and Possible
Steps to Accelerate Such Deployment Pursuant to
Section 706 of the Telecommunications Act of
1996, as Amended by the Broadband Data
Improvement Act

GN Docket No. 09-137

A National Broadband Plan for Our Future

GN Docket No. 09-51

**COMMENTS OF
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION**

The Pennsylvania Public Utility Commission (PaPUC) hereby submits these Comments in response to the Federal Communication Commission's (FCC) Public Notice of Inquiry issued on August 7, 2009 (the *Broadband NOI*). The FCC set deadlines of September 4, 2009 and October 2, 2009 for filing Comments and Reply Comments, respectively.

The PaPUC appreciates the opportunity to file Comments. As an initial matter, the PaPUC Comments should not be construed as binding on the PaPUC in any proceeding before the PaPUC. Moreover, these Comments could change in response to subsequent events. This includes a later review of other filed Comments and legal or regulatory developments at the federal or state level.

The *Broadband NOI* makes several important inquiries. First, the FCC asks if the Rural Utilities Service/NTIA speed for broadband should also be adopted by the FCC,¹ even though that proposed speed may differ from the minimum speed established by states like Pennsylvania.² Second, the FCC asks whether the broadband measurement should focus on deployment, availability, or customer subscriptions based on Census Tracts (which cover approximately 4,000 persons) or Census Blocks (the smallest Census measurement of which there are over 8,000,000 in the country). Finally, the FCC asks how broadband should be measured and what role consumer surveys should play in measuring broadband.

In addition, the FCC also poses the following questions. First, the FCC asks how broadband should be defined. Second, the FCC asks whether broadband is available to all Americans. Third, the FCC asks whether the current level of broadband deployment is reasonable and timely. Fourth, the FCC asks what actions should be taken to accelerate broadband availability. Finally, the FCC asks for input regarding the actions it should take to improve broadband data collection efforts.

The PaPUC makes several brief comments. The PaPUC's comments reflect the fact that the American Internet Industry Association has recognized that Pennsylvania has the most aggressive rural broadband deployment program in the nation.³ These

¹ The USDA's Community Grant Program defines broadband to be at least 200 kbps in the consumer's connection. The recent joint NTIA/RUS grant program defines broadband to be two-way data transmission with advertised speeds of 768 Kbps downstream and 200 Kbps upstream. *Broadband NOI*, paragraph 36.

² Pennsylvania statutory law classifies "broadband" as a "communications channel using any technology and having a bandwidth equal to or greater than 1.544 megabits per second (Mbps) in the downstream direction and equal to or greater than 128 kilobits per second (Kbps) in the upstream direction." 66 Pa. C.S. § 3012.

³ United States Internet Industry Association, *"Deployment of Broadband to Rural America: An Evaluation of Current Broadband Services To Rural Americans and The Impact of Internet Public Policy On Broadband Deployment"* (March 2008), pp. 4-5, 13 ("Members of the Pennsylvania Telephone Association committed to the most aggressive broadband deployment

Comments demonstrate that successful implementation of a broadband deployment program in rural and urban is possible even when a state like Pennsylvania has the nation's 3rd largest rural resident population and the 3rd largest population of elderly citizens.⁴ Pennsylvania has valuable input, experience, and suggestions for the FCC to consider as they focus on broadband deployment.

The Definition of Broadband. Broadband should not be defined in a manner that undermines the current broadband efforts and defined speeds set out by state laws, including Pennsylvania law at 66 Pa.C.S. § 3012. To facilitate broadband deployment, Pennsylvania implemented costly local rate increases and access rate reforms to attain a statutorily mandated broadband speed of 1.5 Mbps downstream and 128 kbps upstream.

Pennsylvania carriers provide broadband availability in the service territories of all but two Rural Local Exchange Companies (RLEC's) in Pennsylvania as of December 31, 2008. The remaining two RLEC's, Embarq and Windstream, are on schedule to provide ubiquitous broadband availability by December 31, 2013. Similarly, the non-rural Verizon Pennsylvania and Verizon North incumbent local exchange carrier (ILEC) telephone companies have to complete their broadband deployment commitments throughout their service areas – including many rural exchanges – no later than 2015.

plan in the nation under Act 183 of 2004. Under the act, the telephone companies committed to meet established goals for deployment of broadband statewide. Today, many of the companies are already 100 percent deployed.”). A copy is attached at Appendix A to this filing.

⁴ Rural Data on Pennsylvania having the nation's third largest rural population is from the Census 200. See U.S. Bureau of the Census. Census 2000, Table P2. Rural and Urban Population by State http://factfinder.census.gov/home/saff/main.html?_lang=en
Census Bureau Data on Pennsylvania having the nation's third largest senior citizen population is from the Census 2000. See U.S. Bureau of the Census, Population Estimates, Population Division, 2008 Population Estimates by state <http://www.census.gov/popest/estbygeo.html>

Federal efforts should not focus on undermining the successes achieved by Pennsylvania and other similarly situated states. The FCC should not impose a new higher broadband speed in areas that already have attained broadband availability. Instead, the FCC should focus on promoting broadband availability in other areas of the nation that lack meaningful broadband availability at the reasonable speed that is already being implemented in Pennsylvania.

Federal efforts should focus on bolstering efforts underway in Pennsylvania to facilitate middle-mile deployment, particularly for broadband facilities and services in rural areas where the market cannot or will not provide that deployment. The FCC should additionally focus on promoting broadband to schools and libraries, anchor tenants like medical facilities, and veterans' homes.

To that end, the FCC should support Pennsylvania efforts currently seeking about \$108M in supplemental federal support. Those proposals build on the efforts already attained in promoting broadband availability, particularly in rural Pennsylvania where deployment has been paid for and financed by Pennsylvanians.⁵

⁵ Pennsylvania's Office of Administration (OA) is seeking \$28.7M toward a \$35.9M program to extend broadband in large areas of rural, northern Pennsylvania that currently is not served, or is underserved by, commercial providers. This includes an east-west corridor between I-80 that would include 988,000 households in 32 counties, 202,000 business, 1,222 public safety agencies, 1,180 educational entities, and 225 health care facilities. The Department of Community and Economic Development (DCED), an entity that also maps broadband in Pennsylvania, is seeking \$7.9M toward a \$10M initiative to assist anchor institutions. The DCED and OA are also jointly seeking \$4.5M to map statewide *availability* and *adoption* of broadband facilities and services. Pennsylvania's Department of Education is seeking \$49.7M toward a \$113.2M program to connect 514 schools, libraries, colleges, and universities; \$12.5M toward a \$25M project to train approximately 1,500 educators, and 5M toward a \$10M program to expand classrooms into libraries and community colleges. Finally, the Department of Military and Veteran Affairs is seeking \$381,360 toward a \$478,700 effort to provide access, training, and education to 1,500 residents of Pennsylvania's six state veterans' homes. A summary of those proposals is attached as Appendix B.

Broadband Availability to All Americans. The PaPUC is unable to affirmatively conclude whether broadband is available to all Americans. As indicated above, however, the PaPUC can state that Pennsylvania has successfully attained broadband availability at 1.5 Mbps downstream and 128 Kpbs upstream in all but two of Pennsylvania's Rural Local Exchange Companies (RLEC's) service territories as of December 31, 2008. The remaining two RLEC's, Embarq and Windstream, are on schedule to provide ubiquitous broadband availability by December 31, 2013. Similarly, the non-rural Verizon Pennsylvania and Verizon North incumbent local exchange carrier (ILEC) telephone companies have to complete their broadband deployment commitments throughout their respective service areas – including many rural exchanges – no later than 2015.

The PaPUC has overseen the implementation of local rate increases as well as the reform of intrastate access rates for long-distance communications to achieve this broadband availability. The PaPUC undertook those efforts as part of a legislative determination to provide carriers with the additional resources needed to deploy broadband facilities and services throughout the Commonwealth, most particularly in our rural areas.⁶ In addition, Pennsylvania instituted its own state-specific universal service fund that assists in the maintenance of affordable local exchange telephone service rates for many end-users of rural ILECs.

National Deployment of Broadband. Third, the PaPUC can say that broadband access is reasonably available in Pennsylvania given these facts even though Pennsylvania continues to face the considerable challenge of completing broadband deployment, particularly for middle-mile facilities in rural Pennsylvania, as documented in Pennsylvania requests for federal support. Even this success, however, has not come without a substantial cost. As indicated above, Pennsylvania has increased local rates,

⁶ The PaPUC is statutorily mandated to manage the interrelationship of intrastate carrier access rates and other non-competitive service rates of regulated ILECs in a "revenue neutral" manner. 66 Pa. C.S. § 3017(a).

undertaken substantial reform of its intrastate access rates, and created a state universal service fund to support that work.

Additional Measures to Accelerate Broadband. Fourth, Federal efforts to bolster broadband availability in areas that have not implemented reforms like those completed in Pennsylvania should be required to implement similar reforms as a precondition to getting federal support. This is necessary to ensure that federal funding and support is equitably provided to all areas of the nation, including those areas that have already implemented broadband deployment efforts while continuing to support ancillary federal universal service programs.

Additional Broadband Data Measures. The PaPUC suggests that the FCC's efforts to increase broadband data availability must be reconciled with prior decisions. This includes the decision to "forbear" from requiring carriers subject to the FCC's jurisdiction to report on broadband capital spending and consumer satisfaction in their service territories.⁷ Moreover, the FCC also needs to seriously examine the prior decision to "forbear" from unbundling for non-copper facilities⁸ and the continued classification of vertically integrated broadband services as "information" service despite

⁷ *In re: Service Quality, Customer Satisfaction, Infrastructure, and Operating Data Gathering*, Docket No. 07-204 (September 6, 2008) (the "ARMIS Forbearance Orders"), paragraphs 1 and 7. In these *ARMIS Forbearance Orders*, the FCC granted in significant part AT&T's petition for forbearance from the ARMIS service quality and infrastructure reporting requirements. The FCC also found that the conclusions underlying the AT&T Forbearance decision held true for the other carriers required to file ARMIS Reports 43-05, 43-06, 43-07, and 43-08. The FCC extended to Verizon and Qwest the conditional forbearance granted to AT&T in the *AT&T Cost Assignment Forbearance Order*. The PaPUC stated then, and reiterates today, its opposition to granting forbearance from important reporting requirements on infrastructure investments and customer satisfaction, subjects that are critical to states focused on broadband deployment, only to have the FCC later recognize the error of that approach by seeking input on the role that infrastructure investment and customer satisfaction information play, and will continue to play, in developing a national communications network.

⁸ *Triennial Review Order*, 18 FCC Rcd 16978, paragraphs 273-273; *Triennial Review FTTC Reconsideration Order*, 19 FCC Rcd 20293, paragraphs 9-19 (2004); *Triennial Review MDU Reconsideration Order*, 19 FCC Rcd 15856, paragraphs 7-9 (2004).

reliance on an underlying telecommunications transmission component.⁹ Those decisions effectively prevent competitors from reaching consumers using facilities other than the increasingly-outmoded copper network. Those decisions also effectively prevent the states from ensuring that all competitors serving customers jointly shoulder the burden of financing and maintaining the underlying networks needed to construct a truly national broadband network in all areas of the country, including those areas where the market alone is either incapable or unable of providing broadband

Finally, the FCC should adopt the most reasonable and effective measurement for determining broadband deployment. Although the Census Tract may measure service in bundles of 4,000 persons, the nation's critical reliance on broadband availability and service may warrant using the smallest unit of measurement that is available i.e., the Census Block. The PaPUC tentatively suggests that the Census Block is the most effective way to uniformly measure broadband deployment on a going forward basis because it is more granular but, again, only so long as this federal effort does not

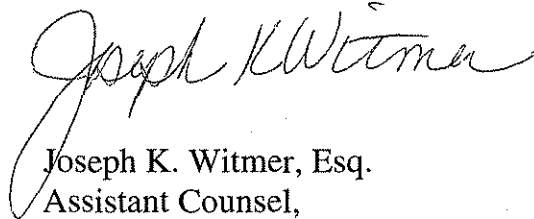
⁹ *Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities, Declaratory Ruling, Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities, Declaratory Ruling and Notice of Proposed Rulemaking*, 17 FCC Rcd 4798, 4921-23, paragraphs 36-38 (2002); *Wireline Broadband Ruling*, 20 FCC Rcd at 14863-64, paragraphs 14-15 and 103, affirmed *NCTA v. Brand X Service*, 545 U.S. 967, 125 S.Ct. 2688 (2005); *United Power Line Council Petition for Declaratory Ruling Regarding the Classification of Broadband Over Powerline as an Information Service*, Docket No. 06-10, 21 FCC Rcd 13281 (2006). On the other hand, because some carriers have claimed that "information service" providers have no interconnection rights to the carriers' networks, the FCC then had to rule that wholesale transmission service is telecommunications service regardless of the nature of the services provided over that transmission service but in a manner that was entirely consistent with state law. *Wireline Broadband Order*, 20 FCC Rcd at 14901, 14909-910, paragraphs 90 and 103; *In re: Fiber Technologies, L.L.C.*, File No. EB-05-MD-014 (February 23, 2007); *Rural Telephone Company Coalition v. PaPUC*, 941 A.2d 751 (Pa. Commonwealth 2008). In addition, the FCC has also had to rule that cable providers are wholesale transmission service providers with rights to interconnect and that contrary state decisions were preempted. *In the Matter of Time Warner Cable Request for Declaratory Ruling that Competitive Local Exchange Carriers May Obtain Interconnection Under Section 251 of the Communications Act of 1934, as Amended, to Provide Wholesale Telecommunications Services to VoIP Providers*, WC Docket No. 06-55, (March 1, 2007), paragraphs 1, 9-12 and 15. Clearly, Title II Common Carrier status plays, and will play, an indispensable role in promoting and financing a broadband network.

undermine successful deployment of broadband availability at a reasonable speed under existing Pennsylvania law.

The PaPUC appreciates the opportunity to file these Comments. The PaPUC reiterates that the positions taken in these initial Comments are general and may change, particularly following review of the other filed Comments.

Respectfully submitted,

Pennsylvania Public Utility Commission

A handwritten signature in cursive script, reading "Joseph K. Witmer". The signature is written in dark ink and is positioned above the printed name and title.

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APPENDIX A



Deployment of Broadband To Rural America

*An Evaluation of Current Broadband
Services To Rural Americans and
The Impact of Internet Public Policy
On Broadband Deployment*

March 4, 2008
US Internet Industry Association

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Formed in 1994, the US Internet Industry Association is the primary trade association for companies engaged in Internet commerce, content and connectivity. USIIA serves its members through legislative advocacy and professional services. The association is headquartered in Washington, DC.

David P. McClure is President and Chief Executive Officer of the US Internet Industry Association. A technologist by education and experience, McClure has held positions in the Internet, computing, aerospace and environmental services industries. He is widely published on technical and business topics, and is the author of more than 40 white papers related to Internet and Broadband policy, governance and economics.

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Executive Summary

The accepted political dogma that America has in some way failed in its efforts to deploy broadband is based on a series of miscalculations. First, it confuses the level of deployment with the level of adoption, casually mixing data on each though different factors are involved. Second, it compares the data from America with data from other countries, even though this data has not been normalized for factors such as population density or percentage of rural versus suburban or urban areas. Finally, the data that does exist is presented in ways intended to support a specific policy or political view rather than allowing the data to speak to itself.

In reality, the adoption of broadband and Internet technologies by the American consuming public has been the most rapid in the nation's history. With overall home broadband penetration breaking 50% in a September 2007 survey, Pew Internet found that broadband was adopted by a majority of consumers faster than other technologies. Broadband took 10 years to break 50% adoption, followed by the CD Player at 10.5 years, the VCR at 14 years, cell phones took 15 years, color TVs took 18 years, as did the personal computer.

More to the point, a 2008 survey of its members by the US Internet Industry Association, combined with information provided by affiliated telecom associations, finds robust levels of deployment in the majority of states, and significant planned investments for expansion in the immediate future:

- ConnectKentucky, often cited as a model for broadband deployment research and public/private partnerships, has increased broadband penetration in that state from 60 percent in 2001 to 94 percent as of August, 2007, with a goal to reach 100 percent coverage of state residents by the end of 2007.
- The state of California on January 17, 2008, announced the release of the report of the California Broadband Task Force. This report notes that 96% of California residences have access to broadband.
- The Montana Telecommunications Association reported in late 2006 that the state's independent telecom companies have deployed over 5,000 (approaching 6,000) miles of fiber optic facilities statewide -- in a state with an average of fewer than three telephone access lines per mile.
- Members of the Pennsylvania Telephone Association committed to the most aggressive broadband deployment plan in the nation under Act 183 of 2004. Under the act, the telephone

companies committed to meet established goals for deployment of broadband statewide. Today, many of the companies are already 100 percent deployed.

- The Iowa Telecommunications Association, the nation's largest and second-oldest telecom association, reports that it has the largest number of broadband Internet providers in the nation (233), and that 92.9 percent of Iowa communities (1,144 out of 1,291) have access to one or more broadband providers. In Iowa, rural communities often have better access than non-rural areas – a "reverse digital divide."
- The Minnesota Center for Rural Policy and Development reports that broadband adoption continues to grow unabated throughout rural Minnesota and that 49 percent of all Minnesota households now connect to the Internet from home using a broadband connection.
- Virtually all citizens of New York have access to broadband services.
- The National Telecommunications Cooperative Association (NTCA) – the "voice of rural telecommunications" -- reported in September of 2007 that "ninety-nine percent of the 2007 survey respondents offer broadband to some part of their customer base.

This data from the heartland also indicates that while deployment is advancing rapidly, adoption of broadband by consumers – even to those who have it readily available – lags.

Data collected to date supports five conclusions with respect to rural broadband:

- Deployment of broadband has been achieved at a remarkable pace given the land mass of America and the unusually high percentage of residents in rural areas.
- There remain substantial differences between rates of rural deployment of broadband and rates of adoption.
- Issues related to broadband deployment need to be separated from issues related to the adoption and use of these technologies.
- The remaining issues of deployment have been assisted by state and local mapping projects (such as those of California and Kentucky), which have helped to identify area where additional focus and investment are needed. More and better data is needed in order to make effective broadband policy.
- There are programs emerging that focus resources on the factors related to adoption, and these need to be strengthened.

These conclusions will have a significant impact on public policy related to broadband:

- **Regulation of the Internet, from open access to network neutrality, won't stimulate adoption of broadband.**
- **More and better data is needed.**
- **Federal programs should focus on supporting state and local efforts.**
- **Infrastructure investment will still be critical.**
- **The same needs for policy support exist in urban, suburban and rural areas.**

Introduction

The adoption of broadband and Internet technologies by the American consuming public has been the most rapid in the nation's history. With overall home broadband penetration breaking 50% in a September 2007 survey, Pew Internet found that broadband was adopted by a majority of consumers faster than other technologies. Broadband took 10 years to break 50% adoption, followed by the CD Player at 10.5 years, the VCR at 14 years, cell phones took 15 years, color TVs took 18 years, as did the personal computer:

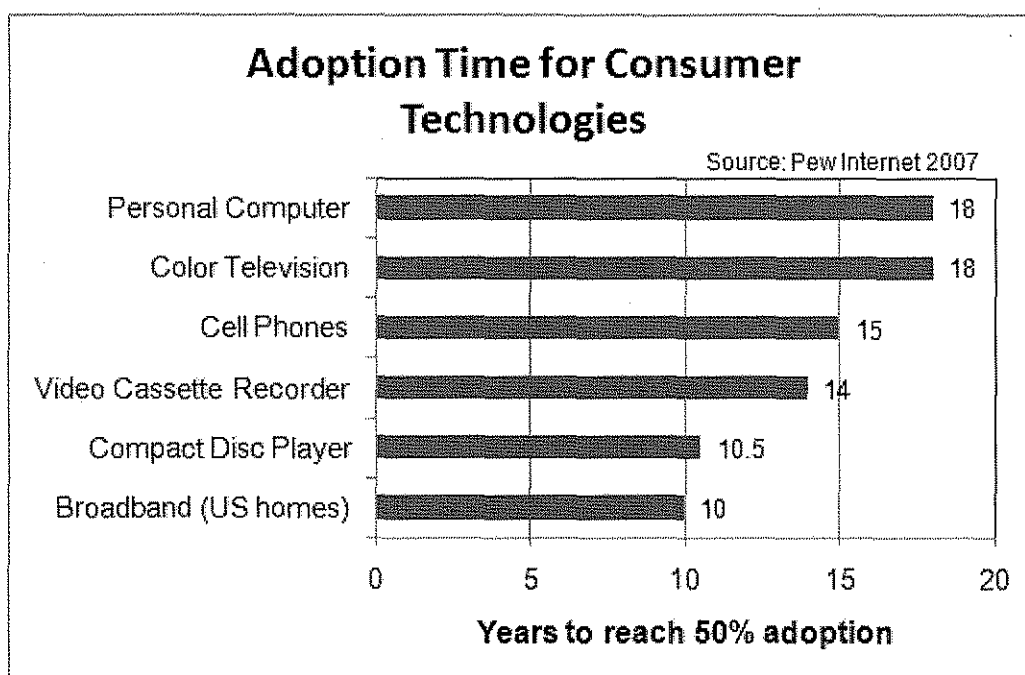


Figure 1: Adoption Time for Consumer Technology

Source: Pew Internet¹

With this rapid adoption has come a wealth of benefits, with the promise of more to come. Global consultant Accenture estimates that the universal deployment of broadband would create 1.2 million new, permanent jobs,² while a 2004 report estimated that broadband adoption could yield annual consumer

¹ <http://www.pewInternet.org>

² "Innovation Delivered - Broadband for Australia, An Economic Stimulus Package, 2001," Accenture, p8.; Building a Nationwide Broadband Network: Speeding Job Growth" by Stephen B. Pociask, pg. 1.

benefits of \$300 billion.³ Added to these are the substantial benefits available through enhanced social interactions, availability of distance learning programs and eHealth initiatives.

But from the outset, this rapid growth in broadband adoption and use presented a paradox – some segments of the American public were significantly slower to adopt and receive benefits from use of the Internet than others. Larry Irving, a former United States head of the National Telecommunications Infrastructure Administration (NTIA) at the Department of Commerce, Assistant Secretary of Commerce and technology adviser to the Clinton Administration, noted this paradox as early as 1995 and termed it the "digital divide."

The term digital divide refers to the gap between those people with effective access to digital and information technology, and those without access to it. Groups often discussed in the context of a digital divide include socioeconomic (rich/poor), racial (white/minority), or geographical (urban/rural).⁴ These digital divides, then, are identified as having two facets – the unequal access to digital technologies (deployment) and unequal ability or desire to make use of these digital technologies (adoption). But while the issue of the "digital divides" is thus multi-faceted, and might be expected to require solutions that are equally multi-faceted, that is not how the issues have been addressed in the public policy arena.

Instead, these issues have manifested in three major groups of claims. First, that cable and telephone companies "redline" some areas on racial or socioeconomic grounds. Second, that companies have failed to deploy some technologies (DSL, fiber, cable Internet, etc.) to some areas on economic grounds. Or third, that they have deliberately blocked or degraded Internet services to some areas or some customers in order to enhance sales of their own competing products. No evidence has been produced to support these claims, and deployment of broadband has continued at a rapid pace, accompanied by lower costs and faster speeds.

Claims of market failure have been more pervasive if no more persuasive. The claims of widespread market failure have been a foundation for calls for open access competition on cable, telephony and fiber networks; it was a basis for the municipal networking movement of 2004 – 2006, in which municipalities attempted to use tax dollars and other public financing to enter the private markets for

³ "Bandwidth for the People," Robert Crandall, Robert Hahn, Robert Litan, and Scott Wallsten, *Policy Review* (October and November 2004): 68.

⁴ Wikipedia definition at http://en.wikipedia.org/wiki/Digital_divide

telecommunications services; and it is today the primary basis for calls to impose common-carriage regulations on broadband Internet networks.

But the argument for market failure is countered by a second great paradox of the "digital divides" – the fact that all of the identified divides are rapidly healing without federal or state regulation of the Internet. If, in fact, regulatory intervention is necessary to heal the divides, this should be impossible. Yet clearly they are healing. As noted in the USIIA position paper on Ethnicity and Broadband Segmentation, black and Hispanic American populations are rapidly catching up to Asian and white populations in terms of Internet and broadband adoption.⁵ There is additional evidence that the disparity between urban and rural broadband adoption has closed from a four-year gap in adoption in 1999⁶ to as little as one year by 2007.⁷

Certainly, there is still work to be done in closing the digital divides in America. Equally clearly, however, this work should be based not on continuing efforts to pursue such unhelpful policies as open access, common carriage laws for broadband networks, municipal networking or network neutrality legislation. It should rather be based on the work over the past decade that has already proven successful in healing the digital divides.

This paper seeks to help in that effort by assessing progress made to date in closing the rural digital divide; identifying factors that assist or impede the deployment and adoption of broadband in rural areas; illustrating successful programs for deployment of broadband to rural residents; and defining steps that need to be taken from a legislative and regulatory perspective to embrace, expand and build upon these successful implementations.

Defining The Issue Of Rural Broadband

⁵ See <http://www.usiia.org/pubs/segmentation.doc>

⁶ US Department of Commerce data at <http://www.doc.gov>

⁷ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf

Definitions of what constitutes "rural" differ widely, and even the US government has three or more definitions, each with different quantitative measures.⁸ Nonetheless, by most measures it is agreed that as much as 97.5 percent of the land mass of the United States is rural, and that as much as 25 percent of the population lives in non-metropolitan/rural areas of the nation."⁹ Even this agreement, however, is unclear -- the Government Accountability Office notes that 45 percent of Americans defined as rural dwellers live in counties that are deemed metropolitan.¹⁰

Similar confusion and a lack of agreement hampers an effective definition of the term "broadband." The US Federal Communications Commission (FCC) generally defines broadband service as data transmission speeds exceeding 200 kilobits per second (Kbps), or 200,000 bits per second, in at least one direction: downstream or upstream.¹¹ The Organization for Economic Cooperation and Development defines broadband in terms of downloads only, at speeds equal to or greater than 256 Kbps.¹² Most observers recognize that these definitions are inadequate and need to be revisited.

Finally, there is the issue of what the goals could or should be for rural deployment and adoption of broadband nationwide. We know what the goals should be -- the deployment of broadband Internet service to every business and residence that needs or wants it, as adjusted for other variables that might diminish demand, at a price point and adoption rate on par with that of non-rural and metropolitan businesses and residences. Such a goal can be quantified by research and is attainable, based on our experience with other mass deployments of new technologies.

With this as a working definition, we need to examine the factors that affect the current rural digital divide. As previously noted, the rural divide can be divided into two major sets of factors -- those related to the physical availability of broadband Internet service (referred to as deployment of broadband) and those related to the resources and skills required to make use of broadband Internet service once it is available (referred to as adoption of broadband).

Unfortunately, these two factors have become so confused in the public policy arena that we most commonly measure adoption rates and then attempt to use this data to dictate deployment policy. It may

⁸ The US Department of Commerce, US Department of Agriculture and US Bureau of the Census have all released substantively different definitions

⁹ General Accounting Office, in its publication *Rural Development: Profile of Rural Areas*, <http://archive.gao.gov/t2pbat6/149199.pdf>, pp. 26-31

¹⁰ Ibid.

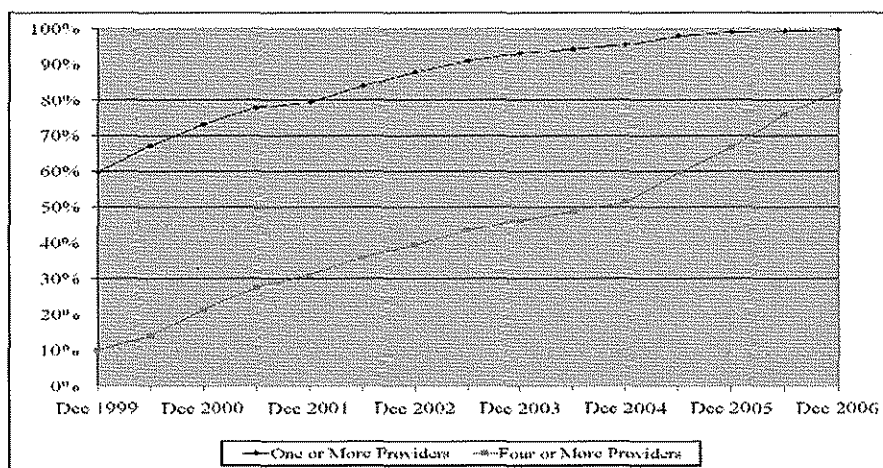
¹¹ See <http://www.fcc.gov/cgb/consumerfacts/highspeedInternet.html>

¹² See http://www.oecd.org/document/7/0,3343,en_2649_34223_38446855_1_1_1_1,00.html

be fortunate that the United States government has to date not taken substantive action to regulate broadband, since this confusion would almost certainly have had unintended and negative effects. We will therefore address each of these two sets of factors – deployment and adoption – separately.

Factors In Rural Broadband Deployment

Collection of useful data on deployment has been made difficult by the lack of common definitions, by the need to keep proprietary corporate information and strategies confidential; and by an inability to agree on a goal whose attainment should be measured. For example, in its 2007 report on high speed Internet connections, the Federal Communications Commission reported that high-speed DSL connections were available to 79% of the households to whom incumbent LECs could provide local telephone service as of December 31, 2006, and that high-speed cable modem service was available to 96% of the households to whom cable system operators could provide cable TV service. The FCC also estimated that over 99% of Zip Codes in America were listed by at least one Internet Service Provider as providing service to that area, and that service was therefore available to more than 99% of the nation's population.¹³



FCC Data: Percent of Zip Codes With High-Speed Providers¹⁴

While there is evidence to suggest that this data may be relevant – a study of businesses in Appalachia found that those in zip code areas in which there was a broadband provider saw

¹³ See http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-277788A1.pdf

¹⁴ See <http://www.fcc.gov/wcb/iatd/comp.html>

productivity gains of between 14% and 17%¹⁵ -- it has also been criticized because the longer distances and average local loop lengths involved may mean that only one customer is served in that zip code.

Data from the OECD, which has for the past several years dominated policy discussions related to deployment of broadband, also gives unreliable results. The OECD data is not validated, and fails to account for Internet usage via wireless and business use. The US Department of Commerce (as well as governments of other countries) has criticized the reports as being inaccurate, with Ambassador David Gross noting that "we are concerned that the current OECD 'subscriber statistics' standing alone fail to account for tens of millions of Americans who access and use broadband services and thereby do not reflect the state of broadband not only in the United States but also in other OECD members as well."¹⁶

There is other data that can assist in identifying the current state of broadband deployment in rural areas. For example:¹⁷

- ConnectKentucky, often cited as a model for broadband deployment research and public/private partnerships, has increased broadband penetration in that state from 60 percent in 2001 to 94 percent as of August, 2007, with a goal to reach 100 percent coverage of state residents by the end of 2007. ConnectKentucky is notable not only for its success in connecting residents to broadband, but for its unprecedented scope of implementation. It is a public/private partnership with bi-partisan political support that is embraced by competing broadband providers and makes use of virtually every broadband platform, from cable and cellular to DSL, wireless and satellite. Finally, it addresses both the issues of adoption (demand for broadband) and deployment (supply of broadband infrastructure). The rapid success of this program has stirred interest from other states, and the Congress is considering legislation that would provide grants for such programs nationwide.
- The state of California on January 17, 2008, announced the release of the report of the California Broadband Task Force. This report notes that 96% of California residences have access to

¹⁵ "The Residential and Commercial Benefits of Rural Broadband: Evidence from Central Appalachia: Final Report," Huntington, WV: Center for Business and Economic Research, June 2005

¹⁶ Letter from the US Department of State to the Secretary-General of the OECD, at http://www.ntia.doc.gov/ntiahome/press/2007/State_OECD_042407.pdf

¹⁷ Except where otherwise noted, information on state deployments of broadband Internet and fiber courtesy of the US Internet Industry Association, its members, and unaffiliated state telecommunications organizations.

broadband, though 1.4 million mostly rural Californians lack broadband access at any speed. Of the 96 percent who do have access, barely more than half have adopted broadband at home. The report calls for state initiatives that include both a further buildout of infrastructure and targeted programs to increase adoption rates.¹⁸

- The Montana Telecommunications Association reported in late 2006 that the state's independent telecom companies have deployed over 5,000 (approaching 6,000) miles of fiber optic facilities statewide -- in a state with an average of fewer than three telephone access lines per mile. Many of these companies have Ethernet backbones, and most, if not all, are replacing their copper plant with fiber, depending on business plans. Most, if not all, greenfields developments today are being built with FTTP deployments. Several Montana ILECs jointly own VisionNet, a consortium that maintains a redundant fiber backbone ring throughout Montana and also provides statewide videoconference, E-911 and tandem services.
- Members of the Pennsylvania Telephone Association committed to the most aggressive broadband deployment plan in the nation under Act 183 of 2004. Under the act, the telephone companies committed to meet established goals for deployment of broadband statewide. Today, many of the companies are already 100 percent deployed, and the rest are making tremendous strides in meeting the commitments made to the PUC as provided for in Act 183. In other words, all of the companies have either met or exceeded their commitments.¹⁹
- The Iowa Telecommunications Association, the nation's largest and second-oldest telecom association, reports that it has the largest number of broadband Internet providers in the nation (233), and that 92.9 percent of Iowa communities (1,144 out of 1,291) have access to one or more broadband providers. In Iowa, rural communities often have better access than non-rural areas -- a "reverse digital divide." In addition, the state has recently announced it will implement a program based on the success of ConnectKentucky to further enhance broadband availability.
- The Minnesota Center for Rural Policy and Development reports that broadband adoption continues to grow unabated throughout rural Minnesota and has clearly accelerated in the past 12 months. For example, in 2003 15 percent of all rural Minnesota households had a broadband

¹⁸ See report at <http://www.calink.ca.gov/taskforcereport/>

¹⁹ Network Modernization Plans filed with the Pennsylvania Public Utility Commission pursuant to Section 3014(f) of Act 183 of 2004.

Internet connection, but our current findings suggest that at the end of 2006 that number had more than doubled to 39.7 percent – substantially higher than the national average. 1,288,291 or 63.5 percent of all Minnesota households now maintain a home Internet connection, and 995,641 or 49 percent of all Minnesota households now connect to the Internet from home using a broadband connection. This estimate is up significantly from our previous estimate of 737,397 households at the end of 2005.²⁰

- Virtually all citizens of New York have access to broadband services. A study conducted by the Public Service Commission in 2003 estimated that over 92% of consumers have high-speed broadband services available to them. Since 2003, the telecommunications industry has continued the roll out of such services throughout the state. New telecommunications modalities such as satellite have increased the availability of such access since the 2003 study. Additionally, high-speed access from BPL, or Broadband Over Power Lines, is being developed and provided in certain areas within the state.
- The National Telecommunications Cooperative Association (NTCA) – the "voice of rural telecommunications" -- reported in September of 2007 that "ninety-nine percent of the 2007 survey respondents offer broadband to some part of their customer base, approximately equal to the 2006 rate and a dramatic increase from the 58% of the 2000 survey respondents who offered broadband. Respondents indicated that they use a variety of technologies to provide broadband to their customers: 99% of those who offer broadband utilize digital subscriber line (DSL), 32% fiber to the home (FTTH) or fiber to the curb (FTTC), 20% unlicensed wireless, 16% licensed wireless, 14% satellite and 12% cable modem."²¹

Nor is this data isolated. The Pew Internet & American Life Project reported in August of 2007 that 71 percent of adults use the Internet at least occasionally from any location. While rural use continues to lag high speed adoption in urban centers and suburbs, it has improved substantially from a year ago, when only 24 percent of rural adults had broadband connections. Today, 60 percent of rural adults use the Internet from any location, compared with the national average of 71 percent.

This data, suggesting that the deployment gap between metropolitan and rural areas is closing, nonetheless shows that there is work that remains to be done in fully deploying broadband Internet

²⁰ "The 2006 Minnesota Internet Study," Minnesota Center for Rural Policy and Deployment, at <http://www.mnsu.edu/ruralmn/pages/Publications/reports/Telecom2006.pdf>

services to rural areas – and beyond that, in deploying fiber Internet in order to achieve even more advanced services.

Factors In Rural Broadband Adoption

While the deployment gap is closing rapidly, however, the gap in adoption rates is closing at a much slower rate. Pew Internet data as recent as 2005 indicates that adoption of broadband stands at only 34 percent in rural America, as opposed to nearly double that rate in urban and suburban areas.

Nor can this gap be attributed to the absence of multiple competitors in every market, a market failure in broadband deployment or even the higher cost of infrastructure deployment in rural areas. If these were the significant factors, we would expect that the gap would have been small prior to broadband, and only grown significantly since the evolution from dial-up Internet to broadband.

A 2000 study by Pew, at the height of the dial-up Internet expansion, found that, "there is notably less Internet penetration in rural areas than in other types of communities. A major factor in rural areas is that a relatively large number of residents don't use computers. 57% of those in rural areas do not have access to the Internet, compared to 47% of those in urban areas and 46% of those in suburban areas. 42% of rural residents do not use computers, compared to 31% of urban residents and 34% of suburban residents who don't use computers."²²

Additional evidence may be found in the adoption rates in rural areas where broadband is available. In testimony filed before the FCC in May of 2007, the Organization for the Promotion and Advancement of Small Telecommunications Companies (OPASTCO) noted that though its rural members now offer broadband Internet access to 90 percent of their customers, only 31 percent choose to subscribe to these services.²³

At the same time, a growing body of data indicates that other factors – notably education, computer literacy rates and household income – play a significant role in adoption of broadband. A study published in Telecommunications Policy in July, 2007 notes that "prior experience with the Internet, the expected

²¹ "NTCA 2007 Broadband/Internet Availability Survey report," September, 2007

²² "Who's Not Online," Pew Internet & American Life Project, September 21, 2000

²³ Before the FCC in GN Docket 07-45, May 16, 2007

outcomes of broadband usage, direct personal experience with broadband, and self-efficacy had direct effects on broadband intentions. Age and income, but not education or ethnicity, also had direct impacts."²⁴ Similar conclusions were reached by the Phoenix Center, which analyzed variances in broadband adoption among the individual states, "Significantly, we find that 91% of the variation is explained by demographic and economic conditions, such as household income, education and, most significantly, income inequality."²⁵

Conclusions Regarding The Rural Digital Divide

Data collected to date supports six conclusions with respect to rural broadband:

- Deployment of broadband has been achieved at a remarkable pace given the land mass of America and the unusually high percentage of residents in rural areas. While there remain challenges in deployment of rural broadband, these are largely issues of investment and technological innovation rather than issues that require changes in policy. For example, deployment in areas where the remote locations of the end user require very long local loop lengths in excess of 20,000 linear feet make it difficult to deploy DSL without further development of that technology and/or investment in sub-stations within the local loop.
- There remain substantial differences between rates of rural deployment of broadband and rates of adoption. Nor is this difference new – Pew Internet & American Life Project has consistently shown that a higher percentage of those who do not use the Internet reside in rural areas.²⁶ US Department of Commerce data in 2000 noted that while Internet adoption stood at 42 percent for metropolitan adults as early as 1995, only 39 percent of rural adults were using the Internet in 1999 — an indication that the rural/metropolitan "divide" existed in spite of the widespread availability and robust competition in Internet access in the Nineties and after. Significantly, the gap is closing -- the Pew Internet & American Life Project notes that rural adoption rates are lagging those of metropolitan adults by roughly one year as of mid-2007.²⁷

²⁴ "Closing the rural broadband gap," Telecommunications Policy, July/August 2007

²⁵ "The Demographic and Economic Drivers of Broadband Adoption in the United States," Phoenix Center Policy Paper No. 31, November, 2007.

²⁶ "Who's Not Online:" September 2000, at http://www.pewInternet.org/pdfs/Pew_Those_Not_Online_Report.pdf

²⁷ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf

- Issues related to broadband deployment need to be separated from issues related to the adoption and use of these technologies. Casually mixing data on each leads to confusion and may negatively impact public policy for the Internet. Likewise, it may be unhelpful to compare data from America with data from other countries, because this data may not have been properly normalized for factors such as population density and percentage of rural versus urban areas.
- The remaining issues of deployment have been assisted by state and local mapping projects (such as those of California and Kentucky), which have helped to identify area where additional focus and investment are needed. More and better data is needed in order to make effective broadband policy. While the data collected by the Federal Communications Commission and by individual service providers is helpful, there may be better mechanisms for data collection on which to form valid goals and strategies.
- There are programs emerging that focus resources on the factors related to adoption, and these need to be strengthened. As the Phoenix Center notes, "policies that focus on these demand-side factors perhaps offer more "bang for the buck" in terms of increasing broadband penetration than supply-side policies, including subsidies for networks or regulation of providers. For example, programs that focus upon educational institutions in low-income communities with school age children-like ConnectKentucky's "No Child Left Offline" initiative-may boost broadband adoption rates considerably, as they leverage demand-side drivers that encourage broadband subscription (having a child in school) in a way that may overcome or mitigate the problem of income inequality. Programs that target broadband education for older and retired persons may also be helpful."²⁸ Programs likely to stimulate demand-side factors include e-government, eHealth and Distance Learning.

Public Policy Ramifications

²⁸ "The Demographic and Economic Drivers of Broadband Adoption in the United States," Phoenix Center Policy Paper No. 31, November, 2007.

The data regarding deployment and adoption of broadband in rural America have significant ramifications on public policy. In particular, there are six elements that need to be communicated at both the federal and state levels:

- **Regulation of the Internet, from open access to network neutrality, won't stimulate adoption of broadband.** Virtually since the beginning of the commercial Internet, the lower adoption rates among rural consumers has been used to push a number of political agendas – from network open access to municipally owned and operated networks, and onward to the current calls for imposition of common-carriage rules on broadband networks. Since none of these "solutions" would act to enhance adoption rates, however, they would have little impact on the level of broadband use in America. If Congress and the state legislatures are to make adoption of broadband a national priority, it must be done through initiatives to educate consumers; reduce income barriers to usage; and implement service programs such as e-government and eHealth that will attract more consumers to adopt broadband into their lifestyles.
- **More and better data is needed.** Because there remain some areas that could be better served by faster and less expensive broadband, it is critical to know where investments and infrastructure buildout are still needed. Existing data does not sufficiently separate deployment from adoption. And the data collection problem should focus not on broadband deployment, where public-private partnerships such as ConnectKentucky are already proving effective in synthesizing the information needed, but rather on the more considerable issues related to adoption rates for broadband. As with any other technology data on which we wish to base policy, this data needs to be subject to validation and peer review.
- **Federal programs should focus on supporting state and local efforts.** Broadband deployment is a local investment issue, and broadband adoption is largely a local education issue. The best and most effective federal programs are therefore more likely to be those that support efforts that can be tailored to the unique needs of each community rather than a single, one-size-fits-all national program. Appropriate programs would thereby include federal grants and loans for infrastructure investments; educational programs for computer literacy and use; financial support for additional research at the state and local levels.
- **Infrastructure investment will still be critical.** Though it is easy to denote the dominance of demand-side policy over supply-side, there remain strong arguments that some form of stimuli for

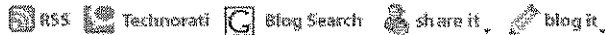
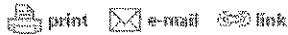
investments in rural broadband will be essential to a more rapid closure of the "rural divide." In particular, states should be encouraged to adopt public/private partnerships in which the state may utilize its resources to document areas that are underserved and to build a business case for infrastructure investments; private companies should then be encouraged or incentivized to make those investments. Additional efforts to build the "value proposition" for broadband adoption – by adding government services to online venues – will also be helpful.

- **The same needs for policy support exist in urban, suburban and rural areas.** As is being experienced with "digital divides" based on ethnicity, age and education levels, the divide between rural access and metropolitan access to broadband is healing as education, investment and innovation take root. Already, there is evidence that the disparity has closed from a four-year gap in adoption in 1999²⁹ to as little as one year by 2007.³⁰ This does not mean, however, that we should stop focusing on deployment and adoption issues in other areas. America is somewhat unique in that rural and urban areas can share the same postal zip code or county. Whatever policies are promulgated to promote deployment and adoption in rural settings should not be at the expense of urban and suburban policies or programs.

²⁹ US Department of Commerce data at <http://www.doc.gov>

³⁰ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf

APPENDIX B



PA Applies for \$108 Million to Expand Broadband Infrastructure, Internet Access, Governor Rendell Says

HARRISBURG, Pa., Aug. 24 /PRNewswire-USNewswire/ -- Governor Edward G. Rendell today said the commonwealth has applied for \$108 million in federal funds to expand high-speed Internet service to people, institutions and communities throughout Pennsylvania -- an investment that will boost the state's economic development and education systems for years to come.

"Broadband Internet access is as crucial to competitiveness as are skilled workers, transportation, water and energy," Governor Rendell said. "You can't overstate its impact on public services, local economies and quality of life. These federal dollars offer an unprecedented opportunity for Pennsylvania to extend the strides we've already made in making broadband available to everyone."

Expanding reliable, affordable high-speed connectivity will preserve and create jobs, help those impacted by the recession, spur advances in science and health, and provide long-term benefits in rural and urban communities, the Governor added.

Pennsylvania's seven applications are competing for some of the \$7.2 billion available nationwide for broadband development under the American Recovery and Reinvestment Act, or ARRA. The funds would advance the state's existing broadband development efforts, as outlined in an aggressive strategy released in July. Applications include efforts to:

- *Aggregate broadband purchases by educational facilities.* The Department of Education applied for \$49.7 million toward a \$113.2 million plan to connect 514 schools, libraries, colleges and universities in a seamless network to close the digital divide, in part by aggregating demand to diminish disparities in price and availability between urban and rural areas. Aggregated demand makes capital investment decisions easier for telecommunication providers.
- *Extend communications infrastructure to reach un-served and underserved areas.* The state Office of Administration applied for \$28.7 million toward a \$35.9 million venture to extend services to a large area of northern Pennsylvania that currently is not served, or underserved, by commercial providers. It would help increase network capacity and enhance existing networks -- cables, wires, towers, antennae and other microwave and land-based infrastructure -- to make it more economically feasible for providers of so-called "last mile" services to reach homes, businesses and other rural customers. The proposal includes an east-west corridor between I-80 and Pennsylvania's northern border, which includes 988,000 households in 32 counties, 202,000 businesses, 1,222 public safety agencies, 1,180 educational entities, and 255 health care facilities.
- *Train educators to enhance instruction by using broadband Internet effectively.* The Department of Education applied for \$12.5 million toward a \$25 million project to train approximately 1,500 teachers and other education professionals on the effective use of broadband for learning, as well as to educate students, parents, school board members and community members about the value of broadband in cost-effective education.
- *Help communities, businesses, first-responders and institutions effectively use broadband.* The Department of Community and Economic Development applied for \$7.9 million toward a \$10 million initiative that will help communities, businesses, first-responders and anchor institutions. The initiative will be carried out by 13 economic development organizations: DCED, the Center for eBusiness and Advanced IT, PennTAP at Penn State, and the state's 10 economic development districts, which are comprised of the seven Appalachian Regional Commission-designated local development districts, the Delaware Valley Regional Planning Commission, the Regional Economic Development District Initiative of South-Central Pennsylvania, and the Lehigh Valley Economic Development Corp.
- *Create broadband centers at libraries, community colleges and other educational facilities.* The Department of Education applied for \$5 million toward a \$10 million effort to expand broadband access beyond classroom walls into libraries and community colleges. It provides equipment, software and other technology, training, technical support, management and oversight for 100 centers across the state.
- *Map broadband availability and adoption throughout Pennsylvania.* Together, the Office of Administration and DCED applied for \$4.5 million to build upon current efforts to map the statewide availability and adoption of broadband service. Non-proprietary information will be made public and searchable at street-address level. Pennsylvania's legislatively mandated broadband mapping inventory, begun in 2004, was one of the first such enactments in the country. If fully funded, \$4 million of this grant would be used over the next five years to gather

more comprehensive and accurate state-level broadband mapping data, to develop state-level broadband maps, and to aid in the development of a national broadband map. As part of the application, the state also requested \$500,000 to perform statewide broadband planning activities and to fund statewide and regional collaboration opportunities.

- *Provide broadband Internet service to veterans' homes.* The Department of Military and Veterans Affairs applied for \$381,360 toward a \$476,700 effort to provide access, education and training to 1,500 residents at the six state veterans' homes. This initiative will provide eight computers and ancillary devices for each of the six veterans' homes; offer training to residents; and provide on-site technical support and troubleshooting to make sure the broadband service and computers are maintained.

Complete applications for each of these initiatives, as well as the state's comprehensive broadband strategy, are available at www.recovery.pa.gov. The information can also be found at www.newpa.com, keyword: Broadband initiatives.

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